CLAIMS:

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- 1. A method for preservation of biological material, comprising:
 - (a) adding a preservation solution to said biological material, said preservation solution comprising one or more polyphenols;
 - (b) cooling the biological material; and
 - (c) storing the biological material at appropriate storing conditions.
- 2. The method of Claim 1, wherein the polyphenols include one or more catechins.
- 3. The method of Claim 2, wherein the catechin is epigallocatechin gallate (EGCG).
 - 4. The method of any one of Claims 1-3, wherein the polyphenols are derived from green tea extract (GTE).
 - 5. The method of any one of Claims 1-4, wherein the preservation solution does not comprise a significant amount of polyalcohols.
- 15 6. The method of Claim 5, wherein the polyalcohol is glycerol.
 - 7. The method of any one of Claims 1-6, wherein the preservation solution does not comprise a significant amount of DMSO.
 - 8. The method of any one of Claims 1-7, wherein the preservation solution comprises a macromolecule.
- 20 9. The method of Claim 8, wherein the macromolecule is dextran.
 - 10. The method of any one of Claims 1-7, wherein the preservation solution comprises trehalose.
 - 11. The method of any one of Claims 1-10, wherein the preservation is cryopreservation, the preservation solution is a cryopreservation solution and the cooling of step (c) is to a temperature below 0°C.
 - 12. The method of Claim 11, wherein the cryopreservation is freezing and the cryopreservation solution is a freezing solution and the cryopreservation of step (c) is by freezing.

- 13. The method of Claim 11, wherein the cryopreservation is lyophilization, the cryopreservation solution is a lyophilization solution the cryopreservation of step (c) is by lyophilization.
- 14. The method of any one of Claims 1-13, wherein the biological material comprises cells selected from red blood cells (RBC), white blood cells (WBC), mononuclear cells (MNC), umbilical cord blood cells (UCB), hematopoietic stem cells (HSC) and bacteria.
 - 15. The method of Claim 12, wherein the biological material comprises RBC and after thawing in appropriate thawing conditions the free hemoglobin levels of the biological material are below 10 percent.
 - 16. The method of Claim 15, comprising:

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- (d) thawing said biological material in appropriate thawing conditions such that after thawing the biological material comprises RBC suspended in a liquid; and
- (e) separating said RBC from said liquid.
- 17. The method of Claim 16, which does not comprise a step of washing the biological material.
- 18. The method of any one of Claims 16-17, wherein step (e) comprises:
 - (e') centrifuging the biological material such that the majority of RBC are in a pellet and the majority of the liquid is in a supernatant; and
 - (e") removing the supernatant.
- 19. The method of any one of Claims 15-18, wherein said free hemoglobin levels are below 2 percent.
- 20. The method of Claim 19, wherein or said free hemoglobin levels are below 1 percent.
- 21. Biological material preserved by the method of any one of the preceding claims.
- 22. Preserved biological material comprising viable biological material and one or more polyphenols.

- 23. The biological material of Claim 22, wherein the polyphenols include one or more catechins.
- 24. The biological material of Claim 23, wherein the catechin is epigallocatechin gallate (EGCG).
- 5 25. The biological material of any one of Claims 23 and 24, wherein the polyphenols are derived from GTE.
 - 26. The biological material of any one of Claims 22-25, wherein the biological material does not comprise a significant amount of glycerol.
- 27. The biological material of any one of Claims 22-26, wherein the biological material does not comprise a significant amount of DMSO.
 - 28. The biological material of any one of Claims 22-27, comprising cells selected from RBC, WBC, MNC, UCB, HSC and bacteria.
 - 29. The biological material of any one of Claims 22-28, having less than 10% H₂O as compared with its H2O content before preservation.
- 15 **30.** The biological material of any one of Claims 22-29, having essentially no glycerol.
 - 31. The biological material of any one of Claims 22-30, having essentially no DMSO.
- 32. Frozen viable biological material comprising RBC and characterized in that
 20 after thawing in appropriate thawing conditions the free hemoglobin levels of the
 biological material are below 2 percent.
 - 33. The frozen biological material of Claim 32, having essentially no glycerol.
 - 34. The frozen biological material of any one of Claims 32-33, having essentially no DMSO.
- 25 **35.** A preservation solution for preserving biological material comprising one or more polyphenols.
 - 36. The preservation solution of Claim 35, wherein the polyphenols include one or more catechins.
- 37. The preservation solution of Claim 36, wherein the catechin is epigallocatechin gallate (EGCG).

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- 38. The biological material of any one of Claims 35-37, wherein the polyphenols are derived from GTE.
- 39. The biological material of any one of Claims 35-38, wherein the preservation solution does not comprise a significant amount of glycerol.
- 5 **40.** The biological material of any one of Claims 35-49, wherein the preservation solution does not comprise a significant amount of DMSO.
 - 41. The preservation solution of any one of Claims 35-40, being a cryopreservation solution.
 - 42. The cryopreservation solution of Claim 41, being a freezing solution.
- 10 43. The cryopreservation solution of Claim 41, being a lyophilization solution.
 - 44. A method for the preservation of biological material comprising RBC comprising:
 - (a) freezing the biological material in appropriate freezing conditions; and
 - (b) storing the biological material at appropriate storing conditions; said method characterized in that after thawing in appropriate thawing conditions the free hemoglobin levels of the biological material are below 2 percent.
 - 45. The method of claim 44, wherein the appropriate freezing conditions include addition of a freezing solution.
 - **46.** The method of claim 45, wherein said freezing solution comprises one or more polyphenols.
 - 47. The method of any one of Claims 44-46, the method comprising:
 - (c) thawing said biological material in appropriate thawing conditions such that after thawing the biological material comprises RBC suspended in a liquid; and
 - (d) separating said RBC from said liquid.

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48. The method of Claim 47, wherein the method does not comprise a step of washing the biological material.

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- 49. The method of any one of Claims 47-48, wherein step (d) comprises:
 - (d') centrifuging the biological material such that the majority of RBC are in a pellet and the majority of the liquid is in a supernatant; and
 - (d") removing the supernatant.

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- 50. The method of any one of Claims 47-49, wherein said free hemoglobin levels are below 2 percent.
- 51. The method of Claim 50, wherein or said free hemoglobin levels are below 1 percent.
- 10 **52.** A method for preservation of biological material, comprising:
 - (a) adding a preservation solution essentially free of any polyalcohol, to said biological material;
 - (b) cooling the biological material; and
 - (c) storing the biological material at appropriate storing conditions.
- 15 **53.** A preserved viable biological material, having a volume exceeding 1 ml, preserved for a period exceeding 40 days.